Customer No.: 31561
Application No.: 10/604,818
Docket No.: 11260-US-PA

REMARKS

This is a full and timely response to the outstanding final Office Action mailed August 9, 2007. Reconsideration and allowance of the application and presently pending claims 1-4 are respectfully requested.

Claim Objections

Claim 1 is objected by this outstanding Office Action.

In response to the objection thereto, Applicant has amended claim 1 to more clearly define the subject matter as claimed, so that it can be clearly known that the discharging occur in advance of the charging in accordance with the currently amended claim 1.

Claim Rejections – 35 U.S.C. §103

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama (US2003/0030382; hereinafter "Koyama") in view of Komiya (US 6,924,602; hereinafter "Komiya").

In response thereto, Applicant hereby otherwise traverses these rejections. As such, Applicant respectfully submits that the present invention as set forth in claims 1 and 2 is novel and unobvious over Koyama, Komiya, or any of the other cited references, taken alone or in combination, and thus should be allowed.

With respect to currently amended claim 1, it recites in all:

A method for driving a current-driven Active Matrix Organic Light Emitting Diode (AMOLED) pixel, comprising:

updating a current value of a current source of the AMOLED pixel;

turning on a charging path used by the current source to charge a storage capacitor of the AMOLED pixel;

in an initial stage of the turning on of the charging path used by the current source to charge the storage capacitor of the AMOLED pixel, in response to a scanning control signal, providing a pre-charging signal to the current source to have the storage capacitor discharged in advance; and

completing the charging of the storage capacitor, and cutting off the charging path used by the current source to charge the storage capacitor of the AMOLED pixel.

Applicant has amended the capacitor as originally filed in claim 1 to the storage capacitor; the amended portions are fully supported by paragraph [0006], for example, which recites: "...When it is operating, at first, a scanning control signal of the scanning line is used to turn on the first TFT 210 and the second TFT 220, such that the current provided by the current source flows through the second TFT 220 to charge the capacitor 240. Meanwhile, the memorized gate voltage makes the current flowing through the first TFT 210 and the third TFT 230 is equal to the current of the current source. Then, when

the scanning control signal of the scanning line is cut off (SCAN OFF), the gate voltage previously memorized is used to control the driving TFT 250, such that the current flowing through the OLED 260 is equal to the current of the current source so as to display the required brightness." (Emphasis added)

Specifically, in column 1, lines 43-47, Komiya describes:

"Light emission of each pixel is controlled in the manner described above. Because of the existence of the storage capacitor SC, the organic EL element EL is capable of emitting light even after the TFT1 is turned off." (Emphasis added)

So in accordance with above cited contents, a person having skilled in the part can certainly understand that the capacitor 240 according to the subject invention is functionally corresponding to the storage capacitor SC in Komiya.

The present invention is directed to a method for driving a current-driven AMOLED pixel. In particular, the method of the present invention provides a pre-charging signal to the driving current source before the data of the AMOLED pixel is updated in order to have the storage capacitor discharge via a discharging path, thereby avoiding the insufficient discharge problem.

In rejecting claim 1, the Examiner admitted that the primary reference, Koyama, "does not disclose an initial stage of the turning on of the charging path used by the

current source to charge the capacitor of the AMOLED pixel, providing a pre-charging signal to the current source to have the capacitor discharged". In addition, the Examiner further cited Komiya as a second reference to teach such limitations. The Examiner contended: "Komiya discloses an initial stage of the turning on of the charging path used by the current source to charge the capacitor of the AMOLED pixel (col. 3, lines 66-col. 4, lines 36), providing a pre-charging signal to the current source to have the capacitor discharged (col. 3, lines 66 to col. 4, lines 36)". However, Applicant respectfully disagrees.

Firstly, in Figures 1 and 2 of Komiya, when the gate line 0 is on, the TFT3 and the TFT4 are turned on, so that the electric charges accumulated in the capacitor of the organic EL element EL and the TFT2 will be discharged, and then the afterimage can be reliably prevented (col. 4, ll. 26-32 and Figure 8). In addition, storage capacitor SC now is *charged* by the power source PVDD, rather than discharged. It is noted, in Komiya, that the "capacitor of the organic EL element" refers to the *parasitic capacitor*, which is *not* a tangible element in the organic EL element, rather than the storage capacitor SC used for controlling the control TFT (i.e., TFT2) (col. 2, ll. 3-10 and col. 3, line 66 to col. 4, line14 and Figure 8). Therefore, what are being discharged are the charges accumulated in the capacitor of the organic EL element, rather than the charges in the storage capacitor SC. In contrast, with reference to Figure 2 of the present application, when the first TFT 210 and the second TFT 220 are turned on by the scanning control signal of the scanning line, the charging path of the capacitor 240 is turned on, where the capacitor 240 is functionally

corresponding to the storage capacitor SC in Komiya. Meanwhile, the control system further provides a pre-charging signal (Pre-Charge) to the current source to have **the capacitor 240 discharged in advance**. For at least this reason, Komiya does not teach or suggest the limitation of "in an initial stage of the turning on of the charging path used by the current source to charge the storage capacitor of the AMOLED pixel, in response to a scanning control signal, providing a pre-charging signal to the current source to have the storage capacitor discharged in advance" as set fourth in claim 1.

Specifically, in column 1, lines 49-53 and column 4, lines 16-26, Komiya respectively describes:

"In an organic EL panel employing such above-described TFTS, the pixels arranged in a matrix and each including the organic EL element, TFT1 and TFT2, are disposed on the same substrate. This structure results in generation of a parasitic capacitor in the organic EL element EL. Accordingly, such a conventional pixel circuit has a problem that even when the TFT2 is off, a current flows in the organic EL element EL in accordance with the charges accumulated in the capacitor of the organic EL element, thereby generating an afterimage." (Emphasis added)

"the TFT3 is turned on by the upper gate line. Specifically, the upper side of the organic EL element EL, namely the drain of the TFT2, is connected to the negative power VEE at the time point one horizontal line before the time point for turning the TFT 1 on, and the charges accumulated in the capacitor of the organic EL element EL are discharged. As a result, when the gate line 1 for the TFT3 is then selected, block data is written, and an

electrical current is prevented from flowing in the organic EL element EL when the TFT2 turns off, such that generation of an afterimage can be reliably prevented."

In those cited contents, Komiya is used to prevent the afterimage caused by the parasitic capacitor, so that Komiya employs the TFT3, the TFT4 and upper TFT3's gate line to make the capacitor of the organic EL element EL discharge, wherein the capacitor of the organic EL element EL is a *parasitic capacitor* formed between the drain and the source of the TFT2, such that the discharged capacitor is the parasitic capacitor, rather than the storage capacitor SC.

Therefore, for at least the foregoing reasons, Koyama and Komiya, alone or in combination, fail to teach or suggest each and every element of the claimed invention. As such, claim 1, as amended is novel and unobvious over Koyama and Komiya, and thus should be allowed.

Claim 2 depends on allowable independent claim 1, and thus should also be allowable as a matter of law.

New claims

Applicant has added two new claims 3 and 4 in the present application. Applicant respectfully submits that the claimed method is suitable for driving a **current-driven** Active Matrix Organic Light Emitting Diode (AMOLED) pixel, which is supported by, for example, paragraph [0017] in the specification of the present application. However,

Komiya is suitable for driving a **voltage-driven** Active Matrix Organic Light Emitting Diode (AMOLED) pixel, which is evidenced by, for example, the "Description of Related Art" in Komiya. Specifically, Komiya is used to prevent the afterimage caused by the parasitic capacitor based on the circuit structure of Komiya's Figure 8. So the circuit structure of AMOLED pixel in Komiya is substantially different from the claimed subject matter of the present application. Furthermore, claim 3 recites features comparable to those of claim 1, so that claim 3 and its dependent claim 4 should also be allowed.

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CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims 1-4 are in proper condition for allowance and an action to such effect is earnestly solicited. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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